

Effectiveness of Using Flipped Classroom Strategy in Academic Achievement and Self-Efficacy among Education Students of Princess Nourah bint Abdulrahman University

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Abstract

The present study is an attempt to measure the effectiveness of using flipped classroom strategy in academic achievement and self-efficacy among female students of College of Education, Princess Nourah bint Abdulrahman University (PNU), Saudi Arabia. The study adopted the experimental method based on the two experimental and control groups, where the experimental group was taught through flipped classroom strategy, while the control group taught in the traditional way. Two tools were applied in this study: (Achievement Test and Self-Efficacy Scale). The sample consisted of two groups: one group is experimental and the other is control, both studying the course of (Classroom Management) in the first semester for the academic year 2016/2017. The results showed that the experimental group outperformed the control group in the post achievement test, as well as having a positive correlation between the students' post achievement test and their attitudes towards self-efficacy scale; indicating that the more scores the students get in achievement test, the more self-efficacy they have. In the light of the results, some recommendations have been made.

Keywords: effectiveness, flipped classroom, achievement, self-efficacy

1. Introduction

Shedding light on the concerns of the appropriateness of curricula, their ability to improve students' thinking level and giving up traditional thinking habits is continual. In recent years, several universities and colleges have noticed the failure of many students in learning and practicing the complicated thinking skills or the simplest skills of critical thinking; hence the quality of higher education gets low, which necessarily made several decision makers in universities transform traditional teaching to flipped classroom strategy in order to qualify students well to succeed in the field of world economic and to fully invest human resources (Jacqueline, 2014).

There are a lot of studies on learning styles that encourage presenting student-based activities and participation in discussion allowing students to effectively control the content, organize effective experiences, think creatively, reinforce cognitive development and improve their academic performance. In addition, the heavy theoretical and applied support for knowledge benefits and motivation for cooperation is increasing unlike the competitive and individual learning activities (Jarvenoja, 2010).

Cooperative learning encourages students to divide teamwork, employ individual contributions and reinforce meta-cognition by providing several chances of communication between learners (Songhao, 2011). Therefore, the developed countries adopt new learning and teaching strategies supported by the rapid development of information and communication technology and the students' spreading use of electronic devices by spending a lot of time on electronic games, e-mails, internet and cell phones. All these devices became an integral part of students' lives, and hence it is important to find evidences on how to make electronic learning a strong motivator for change, how to redesign the educational systems, and how to depend on the internet to reinforce the classroom experience (Songhao, 2011). The model of student-centered flipped classroom leads to digesting the curricula and mastering the skills according to the lower level of the cognitive domain in Bloom's Taxonomy (Knowledge and Comprehension) at home. It also leads to focusing on the higher level of cognitive domain

(Application, Analysis, Synthesis and Evaluation) in the classroom time (Brame, 2013).

This model of flipped classroom is designed to improve students' motivation since it promotes competence, independence and self-motivations. The flipped classroom strategy is probably designed to address the students' needs of self-efficacy and competence through an integrated system. According to studies conducted in the last two decades, students feel self-effective when they participate actively in spreading knowledge unlike what they have previously been when receiving knowledge from the instructor through traditional teaching (Abeysekera, 2015).

In addition, flipped classrooms contribute to encouraging and improving skills in the domains of application, analysis, synthesis and evaluation which are all mental skills and processes not covered by the traditional curricula (Lihle, 2015). It also contributes to what is known as ownership for learning, where students can watch a video or lecture several times (Mor, 2014). This model led to building the confidence and enjoying the content and it provided more chances for interaction, learning, positive change and responsibility towards education (Mor, 2014). The flipped classroom strategy integrates two learning theories; i.e. traditional learning and active learning, being based mainly on flipping the learning process where students receive the lesson's new concepts at home through 5-10 minutes video clips or social media networks by modern technologies such as smart phones and laptops (Bishop, 2013)

2. Statement of the Problem

The continuous concerns about the inappropriateness of traditional curricula in properly investing human resources and practicing the complicated thinking skills led to the need of transforming these curricula to modern teaching strategies in order to improve critical thinking, reinforce the cognitive process, improve academic performance and master the skills. Flipped classroom is considered one of the modern student-centered strategies contributing to understanding the educational content supported by electronic learning technologies to become robust motivators for change where the instructor is able to supervise. Additionally, this strategy helps providing several opportunities of communication between learners. It positively changes students and builds what is called ownership for learning, the learners' feeling of responsibility towards learning and their feeling of self-efficacy.

University students depend on the traditional way of receiving and memorizing information without any responsibility in getting and applying it or seriously discussing its sources and reasons. Due to her work at the university for many years, the author felt the significance of applying the flipped classroom strategy to make teaching more exciting and interesting from the one hand, and to get the learner positive and responsible for the learning process or what is called (Ownership for Learning) from the other hand (Mok, 2014). Multiple studies recommended the need of conducting more research on this field (Johnson & Renner, 2012). Learners must reach higher thinking skills of application, analysis, synthesis and evaluation. Losing these skills leads to a lower quality of higher education (McLaughline, 2014). This is consistent with the nowadays requirements, findings and growing challenges and also meets the requirements of job market and the need of keeping track of modern technology in the field of education. Due to the major role of self-efficacy in developing the higher thinking skills, the flipped classroom strategy should be utilized in developing students' self-efficacy.

2.1 Questions

Thus, the study is an attempt to answer the following major question:

What is the effectiveness of using flipped classroom strategy in teaching the course of "Classroom Management" in academic achievement and self-efficacy among students of College of Education, Princess Nourah bint Abdulrahman University (PNU)?

This question is subdivided into the following questions:

- 1) What is the effectiveness of using flipped classroom strategy in teaching "Classroom Management" in academic achievement among students of College of Education, PNU?
- 2) What is the effectiveness of using flipped classroom strategy in teaching "Classroom Management" in self-efficacy among students of College of Education, PNU?

3. Objectives

The present study aims at:

- 1) Exploring the effectiveness of using flipped classroom strategy in teaching Classroom Management in academic achievement among students of College of Education, PNU.

2) Exploring the effectiveness of using flipped classroom strategy in teaching Classroom Management in self-efficacy among students of College of Education, PNU.

4. Significance

The significance of this study lies in highlighting the deficiencies of using traditional ways by trying flipped classroom strategy which is student-centered not teacher-centered. It is expected that the study results would contribute to providing suggestions of effectively employing technological applications in education, providing feedback for decision makers and those who are preparing university programs and study plans in order to employ this strategy in higher education. This study may draw the attention of decision makers to the importance and need of developing and not marginalizing higher thinking skills among university students. The study helps students practice some higher thinking skills which would help them practically apply them in real life inside and outside the classroom.

5. Hypotheses

- 1) There are no statistically significant differences in the mean scores of the experimental and control groups at the level ($\alpha < 0.05$) in Academic Achievement test.
- 2) There is no statistically significant difference in the mean scores of the experimental and control groups at the level ($\alpha < 0.05$) on the self-efficacy scale.
- 3) There is no correlation between the students of the experimental group and the control group at the significant level ($\alpha < 0.05$) in the achievement test and self-efficacy scale.

6. Study Terms

Effectiveness: In experimental educational studies, the term “effectiveness” refers to the degree of impact of experimental treatment being considered as a dependent variable in one of the independent variables (Ali, 1997). In this study, it is procedurally defined as: The possible impact of the flipped classroom strategy on improving academic achievement and self-efficacy among students of the Department of Curricula at PNU. This impact was statistically measured by calculating Eta-squared (η^2).

Flipped Classroom: It is a learning model aimed at replacing the traditional lecture by active cooperative tasks using internet and computer technology to transmit a video lecture to be watched at home; and then students discuss it through some pair activities. It is procedurally defined as a student-centered educational strategy where students at PNU watch a short video at home; and then the classroom time is spent in an active interactive educational environment supervised by a faculty member in order to apply, by several group activities, what they previously watched.

Self-efficacy: It is defined as one's beliefs in one's personal abilities to prepare motivation, cognitive resources and required action programs in order to handle a situation (Abdel Mo'tty, 2004). It is procedurally defined as the student's mental image of her personal abilities required for applying the flipped classroom strategy.

7. Literature Review

Long, Taotao & Long, et al (2016) aimed at presenting reports and recommendations to participants in the case of using flipped classroom approach. It adopted a qualitative approach because it helps to find out a specific phenomenon through collecting data by conducting interviews with a trainer and five students participated in a TEAL course using the flipped classroom strategy. The participants watched video clips before the lecture and then they participated in cooperative learning activities such as collaborative projects, field trips and presentations. This study concluded that using this educational approach (flipped classroom) is a new experiment that contributed to developing the students' skills of problem solving and cooperation and it is a student-centered approach. Liebert, Cara & Lin, Dana T (2016) aimed at applying the flipped classroom strategy as an alternative for the traditional classroom. The flipped classroom strategy has been never used in the field of clinical surgery. The participants were (89) first-year students enrolled for the curriculum of clinical surgery and they were (92) students for the two groups. The results showed a high level of professional benefit in surgery in addition to the learners' satisfaction, acquisition of effective knowledge and the formation of positive attitudes towards the surgery profession. Lai, Chiu-lin and Hulang, Gwo-Jen (2016) aimed at presenting the experiment of flipped classroom that allows the effective practice and positive interaction between students and instructors. The study applied the quasi-experimental design to the Mathematics Curriculum in the primary stage for the experimental group, while the control group was taught in the traditional way of a flipped classroom. The experimental group was taught through the flipped classroom and it was self-organized while the control group was taught through flipped classroom but in its traditional way. This experiment helped students acquire the skill of active learning,

personality building and self-organization leading to the high achievement of students who applied the self-organized flipped classroom learning compared to those who applied traditional flipped classroom learning. The overall performance of self-organization of the experimental group is too much better than that of the control group. Seery (2015) presents a project of flipped classroom on a group of university students. The objective of providing them with lectures in advance was to give them enough time for deeper discussion. They were (51) students who were studying (Chemical Thermodynamics). They completed some work sheets after watching the lecture on videotapes. This study confirmed the effectiveness of flipped classroom in providing deeper understanding for the content, and in the participation of all the students in the lecture and in providing continual evaluation. Mok (2014) aimed at trying the flipped classroom strategy on students who were studying programming in the College of Computing at Singapore University. Learning activities were presented at the class time instead of lectures. The results showed the students' positive attitudes towards this strategy. Students expressed the most prominent characteristics of this strategy such as that they could watch the lectures several times until they got the content and they become responsible for learning (Responsibility for Learning). Mattis (2014) aimed at applying flipped classroom using educational technology in higher education institutions. This application aimed at combining the effectiveness of traditional learning and internet. The objective of this study was to identify the differences between flipped classrooms and traditional classrooms and to apply flipped classrooms to students of Northern California Nursing Academy (NCNA). The control group consisted of (22) students; the experimental group consisted of (40) students. Pre and post tests were applied to the experimental group. The results showed the accuracy of the results of the flipped classroom group using less mental effort through multimedia education. Trogden (2014) illustrated the adequate time required for providing more productivity. It provided adequate time for Organic Chemistry students using flipped classroom by processing data inside the classroom having some more time and supervised by the instructor. Providing time for learners made it available for them to get higher scores through tests. Moreover, it minimized their anxiety and offered them better learning. Lim & Kim et al (2014) applied flipped classroom strategy to two courses. These two courses were different in topic, learners and trainers. It showed differences in the types of applications and the learners' responses according to the trainers and topics. The results also showed that using different flipped classroom strategies provides learners' reactions and a purpose of learning. This study recommended conducting more studies in that field. Sahin, Alpaslan & Cavlazoglu Baki et al (2014) aimed at understanding the perspectives of students to whom the flipped classroom strategy was applied where the lectures' videotapes become more enjoyably being available on the internet for Mathematics curriculum. The participants were (96) students. After analyzing the results of traditional and flipped classrooms, it appeared that the scores of flipped classrooms were higher than those of the traditional classrooms. Also, their learning was better.

Hantla, Brycef (2014) applied the quasi-experimental approach to explore the impact of flipped classroom on critical thinking used in the College of Liberal Arts according to (CCTST Test). Moreover, it investigated the effects of flipped classroom according to seven scales of College and University of classroom environment (CUCET). The results showed a better change according to the critical thinking scale and the classroom environment scales because flipped classroom provides more concentration and effective participation by students compared to the traditional method. AlMakhrafy (2010) aimed at identifying the relationship between academic self-efficacy and some personality traits among a sample of university students and identifying the difference between the means of the respondents' scores on the academic self-efficacy scale according to the variables of gender and specialization.

Diana (2003) aimed at investigating the relationship between self-efficacy and academic achievement in the College of Science, Department of Anatomy according to the variables of gender and age. The sample consisted of (206) students. The results showed that there is no relationship between self-efficacy according to the variables of gender and age while there is a relationship between self-efficacy and academic achievement.

8. Methodology

The present study aims at measuring the effectiveness of using flipped classroom strategy in academic achievement and self-efficacy among students of College of Education, PNU. Thus, the author adopted the experimental method for designing two groups, experimental and control, where the experimental group was taught through flipped classroom strategy, while the control group was taught in the traditional way. Two tools were applied in this study: Achievement Test and Self-Efficacy Scale.

8.1 Population

The population of the study consisted of all the female students in the College of Education at PNU, while the sample consisted of two equivalent groups of female students in the College of Education at PNU who were

randomly selected after adopting the variables and making sure that the two groups are equivalent.

8.2 Tools

In order to achieve the objectives of the study and answer its questions, a scale of self-efficacy was prepared and an achievement test conducted for measuring Bloom higher and lower levels.

8.2.1 The Achievement Test

The achievement test was prepared in order to measure the extent of achievement of cognitive levels of female students in the College of Education at PNU. Its validity, reliability and appropriateness were verified by a group of reviewers who recommended conducting the test to a pilot sample. The test was applied to a pilot random sample of (24) students in the College of Education at PNU. The pilot study aimed at identifying the extent of the clarity of test instructions and items and analyzing the test items. The purpose of analyzing the test items is to calculate the degree of efficiency for every item of the test. It is calculated by the following indicators:

i- *Calculating Facility and Difficulty Indices:*

The process of calculating facility and difficulty indices of each paragraph of the test is required for preparing the test because it contributes to reviewing the extent of paragraph appropriateness and validity to the measurement purposes.

$$\text{Difficulty Index} = \frac{\text{the number of wrong answers}}{\text{The number of wrong answers} + \text{the number of correct answers}}$$

After calculating the difficulty indices, the results are shown in the following table:

Table 1. Facility and difficulty indices for cognitive levels and the total test

Dimension	No. of correct answers	No. of wrong answers	Facility Index	Difficulty index
Remembering	52	44	0.54	0.46
Comprehension	86	58	0.60	0.40
Application	28	20	0.58	0.42
Analysis	26	34	0.43	0.57
Evaluation	31	53	0.37	0.63
Total	223	161	0.58	0.42

Table 1 showed that the facility and difficulty indices of the dimensions (Remembering, Comprehension, Application, Analysis, and Evaluation) were quite acceptable which assured that the indicated dimensions were not difficult. As for the total test, its facility index was (0.58) and its difficulty index was (0.42) referring that the indices were close to (0.05) which is a ratio appropriate for achieving the study objectives.

ii- *Calculating Discrimination Index:*

Discrimination index = the number of correct answers of the paragraph in the higher group – the number of correct answers of the paragraph in the lower group ÷ the number of the items of one group.

The discrimination index of the test was (0.67) referring to the good capacity of discrimination for the total test. Also, it indicates that all the test paragraphs possess the discrimination capacity.

iii- *Calculating the Discrimination Validity of the Test:*

In order to calculate the discrimination validity of the test, the scores were divided into higher than 73% and less than 27% classifying the students into two groups: higher and lower. Then these two groups were compared by a T-Test. The results were shown in the following table:

Table 2. The significance of difference between higher and lower students according to their test scores

classification students	of Number Students	of Arithmetic Mean	Standard Deviation	“T” Value	Significance Level
Higher	6	16.50	1.761		
Lower	6	21.17	2.714	3.533	0.005**

** Statistically Significant at the Level of (0.01).

Table 2 shows that all the total test questions are statistically significant at the level (0.01) indicating that they possess the discrimination capacity between the two groups (higher and lower) which means that the test has a high level of validity.

iv- Calculating the Adequate Test Time Duration

In order to calculate the adequate test time duration, the author used the following equation:

The adequate test time duration =

The time duration of the first student + the time duration of the last student

2

Hence, the adequate test time duration was calculated by this equation; as shown in the following table:

Table 3. The adequate test time duration

Time duration of the first student	time duration of the last student	Total	Adequate time duration
31m	45m	75m	38m

Table 3 shows that adequate time duration for answering the test questions using the mean equation of the adequate time duration is the level of thirty eight (38) minutes.

v. Conducting the Pre Achievement Test

The pre achievement test was conducted on the experimental and the control groups before the beginning of teaching in order to get to know if there are statistically significant differences between the experimental and control group in the total cognitive levels of the pre achievement test. The author used Independent Sample T-test. The results were shown in the following table:

Table 4. The significance of the difference between the mean scores of the pre achievement test of the experimental and control group according to the total cognitive levels

Group	Number of Students	Arithmetic Mean	Standard Deviation	“T” value	Significance Level
Experimental	34	20.25	2.896		
Control	18	18.75	2.667	1.320	0.200

Table 4 shows the low level of the experimental and control groups in terms of the pretest's total cognitive levels. Thus, the results showed that there were no statistically significant differences at the significant level (0.05) between the experimental and control groups regarding the pretest's total cognitive levels. This indicates the equivalence between the two groups in the pre achievement test and hence their appropriateness for the application of the experiment.

8.2.2 The Validity of (Self-Efficacy Scale)

After verifying the face validity of the scale, it was applied to a pilot sample of (18) items. According to the data of the pilot sample, Person correlation coefficient was calculated in order to measure the internal validity of the scale. The correlation coefficient between the score of each paragraph of the scale and the total score of the scale was calculated as shown in the following table:

Table 5. Pearson correlation coefficients of the paragraphs of the self-efficacy scale

Paragraph Number	Correlation Coefficient	Paragraph Number	Correlation Coefficient
1	0.599**	17	0.634**
2	0.638**	18	0.337*
3	0.493**	19	0.762**
4	0.725**	20	0.573**
5	0.420*	21	0.518**
6	0.500**	22	0.549**
7	0.532**	23	0.385*
8	0.645**	24	0.723**
9	0.577**	25	0.425*
10	0.501**	26	0.560**
11	0.829**	27	0.841**
12	0.584**	28	0.578**
13	0.548**	29	0.419*
14	0.707**	30	0.484**
15	0.578**	31	0.419*
16	0.452**	-	

** Statistically Significant at the Level (0.01) and less.

* Statistically Significant at the Level (0.05) and less.

Table 5 shows that the values of the correlation coefficient for each paragraph in the scale are positive and statistically significant at the significant level (0.5) and (0.01) and less, indicating its validity of consistency and its appropriateness for application.

8.2.3 Reliability of the Self-Efficacy Scale

In order to measure the degree of the reliability of the tool, Cronbach's Alpha (α) was used to verify the tool's reliability. The equation was applied to the pilot sample and it showed that the scale's reliability coefficient is high rated (0.81) which indicates that the scale is highly reliable and could be reliable in the field application of the study.

9. Results and Discussion

1) The First Hypothesis: *There are no statistically significant differences in the mean scores of the experimental and control groups at the level ($\alpha < 0.05$) in Academic Achievement test.*

In order to verify hypothesis no (1), Independent Sample T-test was used. The results are presented in the following table:

Table 6. The significance of the difference between the mean scores of the post achievement test of the experimental and control groups

Group	Number of Students	Arithmetic Mean	Standard Deviation	"T" value	The Significance Level
Experimental	34	21.41	3.846	2.454	0.018*
Control	18	18.89	2.805		

* Statistically Significant at the Level (0.05).

Table 6 indicates that the experimental group outperformed the control group in the post achievement test which

is reflected in the presence of statistically significant differences at the significant level (0.05) between the mean scores of the experimental and control groups in the post achievement test in favor of the experimental group taught through the flipped classroom strategy. The result may be due to the effectiveness resulted from using the flipped classroom in teaching Classroom Management in academic achievement in favor of the experimental group taught through the flipped classroom strategy. This strategy is effective in making teaching and lecturing more exciting and interesting from the one hand, and making the learner positive and responsible for the learning process from the other hand.

The result agrees with the study of Sahin, Alpaslan & Cavlazoglu Baki, et al (2014) which concluded that the scores of students integrated in flipped classrooms are better and higher than those of the other group. Also, it is consistent with the study of Mattis (2014) that indicated the less mental effort done by the group that applied flipped classroom through multimedia education. Accordingly, the above hypothesis is rejected and the alternative hypothesis, that there are statistically significant differences between the mean scores of the achievement test of the experimental and control groups at the level ($\alpha < 0.05$), is accepted. In addition, this hypothesis is addressed by comparing the pre and posttests of the experimental group. The results are presented in the following table:

Table 7. Paired Sample T-test of the significance of the difference between the mean scores of the pre and post achievement tests of the experimental students

Test	Arithmetic Mean	Number of Students	Standard Deviation	“T” value	The Significance Level
Pre	19.56	34	3.395		
Post	21.41	34	3.846	-3.971	0.000**

** Statistically Significant at the Level (0.01).

Table 7 shows statistically significant differences at the significant level (0.01) between the pre and post means of the achievement scores of the experimental group in favor of the post test. This confirmed the effectiveness of using the flipped classroom strategy.

2) The Second Hypothesis: *There are no statistically significant differences between the mean scores of the experimental and control groups at the level ($\alpha < 0.05$) in the self-efficacy scale.*

In order to identify if there are statistically significant differences in the mean scores of the experimental and control groups in the self-efficacy scale, Independent Sample T-test was utilized, as shown in table (8)

Table 8. The significance of the differences between the mean scores of the post self-efficacy scale of the experimental and control groups

Group	Number of Students	Arithmetic Mean	Standard Deviation	“T” value	The Significance Level
Experimental	34	62.12	7.219		
Control	18	57.44	5.628	2.386	0.021*

* Statistically Significant at the Level (0.05).

Table 8 showed statistically significant differences at the significant level (0.05) between the mean responses of the post self-efficacy scale of the experimental and control groups in favor of the experimental group who was taught through the flipped classroom strategy. The result confirmed that this strategy helps students think creatively and reinforces cognitive development and meta-cognition by providing several opportunities of communication between learners.

Moreover, this strategy helps students feel self-effective when they actively participate in spreading knowledge unlike those who were receiving knowledge through traditional teaching and lecturing. Thus, flipped classroom strategy acquired them problem-solving skills and confidence in their personal abilities of performing the required tasks. This result is consistent with the study of Lai, Chiu-lin & Hulang, Gwo-Jen (2016) which concluded that the overall performance of self-organization of the experimental group is too much better than

that of the control group. Also, it is consistent with the study of Long, Taotao & Long, et al (2016) which found out that using this method (flipped classroom) is a good experiment contributing to developing the students' skills in problem solving and cooperation and it is a student-centered method. Accordingly, the above hypothesis is rejected and the alternative hypothesis, that there are statistically significant differences between the mean scores of the self-efficacy scale of the experimental and control groups at the level ($\alpha < 0.05$), is accepted.

3) The Third Hypothesis: *There is no correlation between the achievement of the students of College of Education, PNU, after using the flipped classroom strategy and their attitudes towards the self-efficacy scale.*

Pearson Correlation Coefficient was utilized to explain the significance of relation between the two variables, as shown in Table 9:

Table 9. The results of Pearson Correlation Coefficient for the relation between the achievement of the students of College of Education, PNU, and their attitudes towards the self-efficacy scale

	Achievement	
	Correlation Coefficient	Statistical Significance
Attitudes towards the self-efficacy scale	0.697	0.000

Table 9 illustrated that there is statistically significant correlation (positive) at the level of (0.01) between the achievement of the students of College of Education, PNU, after using the flipped classroom strategy, and their attitudes towards the self-efficacy scale. This indicates that the more scores the students get in achievement test, the more self-efficacy they have. This result justifies that the flipped classroom strategy reinforces the concentration and participation of students compared to the traditional method. It also showed that the flipped classroom strategy is effective in improving the level of students' academic achievement, their interaction and participation in the lecture time, their motivation and their feeling of enjoyment. In addition, this strategy leads to improving their self-efficacy, their feeling of being able to participate and perform the assigned tasks; and hence the level of their self-efficacy became higher. Consequently, they got able to do positive things for the sake of change. This finding is in consistence with the study of Diane (2003) which concluded that there is a correlation between self-efficacy and academic achievement.

10. Conclusion

The experimental group outperformed the control group in the post achievement test represented by the statistically significant difference at the level (0.05) between the mean of the scores of the experimental and control group in the post achievement test in favor of the experimental group taught through the flipped classroom strategy.

There is a statistically significant difference at the significant level (0.01) between the pre and post means of the achievement scores of the experimental group in favor of the post test. This confirmed the effectiveness of using the flipped classroom strategy.

There is a positive correlation between the College of Education students' achievement and their attitudes towards the self-efficacy scale after applying the flipped classroom strategy, indicating that the more scores the students get in achievement test, the more self-efficacy they have.

11. Recommendations

- Applying the flipped classroom strategy to all the courses taught in PNU.
- Preparing university programs and study based on applying this strategy in university education.
- The need of transforming traditional curricula to flipped classroom strategy in order to well prepare the students.
- Using electronic learning technology more widely.
- Paying more attention to the development of higher thinking skills among university students.
- Training students on employing some thinking skills which would help them in the real application in real life.
- The need of conducting further studies on flipped classroom strategy.

12. Suggestions

- Conducting a study similar to the present study on the six levels of Bloom Taxonomy (Remembering, Comprehension, Application, Analysis, Synthesis and Evaluation).
- Conducting a study similar to the present study on other curricula such as Mathematics and Science in all the university stages.
- Conducting a descriptive study on the reality of the flipped classroom strategy.
- Performing a periodical evaluation of the real situation of applying the flipped classroom strategy at PNU.
- Conducting adequate studies on the ways and methods of improving the application of the flipped classroom strategy at PNU.

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